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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/621,125

07/16/2003

Manish Sharma

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1954

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06/08/2005

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EXAMINER

TSAI, H JEY

ART UNIT

PAPER NUMBER

2812

DATE MAILED: 06/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/621,125

Applicant(s)

SHARMA, MANISH

Examiner

H.Jey Tsai

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) 11-14 and 26-40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 15-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 7/16/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

***Election/Restriction***

Applicant's election of claims 1-10, 15-20 and 20-25 in the reply filed on April 6, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 11-14 and 26-40 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected \*\*\*, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on \*\*\*.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 5-10, 15-25 are rejected under 35 U.S.C. § 102(b) as being anticipated by Nickel et al. 2002/0036331.

Nickel discloses a method of developing growth of <111> crystal texture within at least one layer of composition of a magnetic memory cell, the method comprising applying the at least one layer (AF pinning layer or FM pinned layer, para. 36, 35) of composition on a seed layer within the memory cell with a level of ion energy that is sufficiently high to enable alignment of the at least one layer of composition to a high degree of quality for the <111> crystal texture,

a tunneling barrier layer 620 in the memory cell prior to apply the at least one layer of composition (AF or FM),

wherein the magnetic memory cell is a tunneling magneto resistive junction, para. 13,

wherein at least one of the layers of composition is a synthetic ferromagnet, para. 14,

wherein the synthetic ferromagnet comprises:

a first ferromagnetic material 18/16, a non-magnetic spacer layer 27 fabricated on top of the first ferromagnetic material 18/16, and a second ferromagnetic material 22/24 fabricated on top of the non-magnetic spacer layer 27 and having a magnetic field orientation opposite that of the first ferromagnetic material, para. 15-24 and fig. 1,,

wherein the synthetic ferromagnet comprises more than two ferromagnetic materials, wherein the ferromagnetic materials are separated from one another by a non-magnetic spacer layer 27, wherein each successive ferromagnetic material has a magnetic field orientation opposite that of a previous ferromagnetic material, para. 15-24 and fig. 1,

wherein the first ferromagnetic material has a thickness and magnetic field strength, which are equivalent to the second ferromagnetic material, para. 20-27,

wherein the first ferromagnetic material has a different thickness and magnetic field strength than the second ferromagnetic material, para. 29,

seed layer is Ta, para. 19,

ferromagnetic sense layer 18, 24 is NiFeCo, para. 27,

tunnel barrier layer 720 is  $\text{Al}_2\text{O}_3$ , para. 40,

antiferromagnetic pinning layer 716 is IrMn.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2, 3 and 4 are rejected under 35 U.S.C 103 as being unpatentable over Nickel et al. as applied to claims 1, 5-10 and 21-25 above, and further in view of Torng et al. 5,764,445 and Level of ordinary skilled person in the art.

The difference between the references applied above and the instant claim(s) is: Nickel et al. teaches using a high ion energy level deposition to form a magnetic layer which has high degree of quality for the <111> crystal structure and a tunneling barrier layer for memory device but does not teach adjusting the deposition ion energy from lower level to higher level of ion energy (deposition power). However, Torng et al. teaches at col. 4, lines 39-54, col. 9, 10, lines 11-38, that enhancing the crystal orientation (texture) in <111> of a magnetic layer by depositing the magnetic layer in higher plasma power such as 1 KW and/or biased at 50V (increasing ion energy of RF sputter deposition) and measuring the crystal texture (orientation) with X-ray diffraction to check for the high level of quality (enhanced or preferred or predominant) crystal texture (orientation) of the deposited layer. And, adjusting ion energy from lower level to higher level and measuring the crystal texture quality (enhanced or preferred or predominant) in <111> crystal orientation as claimed are taken to be obvious since

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these are variables of art recognized importance which are subject to routine experimentation and optimization and discovery of an optimum value for a known process is obvious. In re Aller, 105 USPQ 233 (CCPA 1955). And, even if applicants' modification results in great improvement and utility over the prior art, it may still not be patentable if the modification was within the capabilities of one skilled in the art, In Re Sola 25 USPQ 433.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above references' teachings by adjusting the ion energy (deposition power) from low to high to obtain an optimum value of high level of quality (enhanced, preferred or predominant) of crystal texture (orientation) of a deposited layer such as magnetic composition material as taught by Torng et al. and an ordinary skilled person in the art because high level quality (enhanced, preferred or predominant) of crystal texture (orientation) of a deposited layer such as magnetic composition material would increase the magnetic field in the memory device which is a magnetoresistive device.

Any inquiry of a general nature or clerical matters or relating to the status of this application or proceeding should be directed to the customer service whose telephone number is (703) 308-4357.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to H. Jey Tsai whose telephone number is (571) 272-1684. The examiner can normally be reached on from 7:00 Am to 4:00 Pm., Monday thru Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael S. Lebentritt can be reached on (571) 272-1873.

The fax phone number for this Group is (703) 872-9306.

hjt

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5/29/2005

A handwritten signature in black ink, appearing to read 'H. Jey Tsai' with a stylized flourish at the end.

H. Jey Tsai  
Primary Examiner  
Patent Examining Group 2800